



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,398	03/07/2002	Seong-Hwoon Kim	017750-698	8639
7590	06/15/2006			
Patrick C. Keane BURNS, DOANE, SWECKER & MATHIS, L.L.P. P.O. Box 1404 Alexandria, VA 22313-1404				EXAMINER LEE, BENNY T
				ART UNIT 2817 PAPER NUMBER

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

SEARCHED DATE

SEARCHED INDEXED  
SERIALIZED FILED

SEARCHED INDEXED

SEARCHED INDEXED  
SERIALIZED FILED

This application has been examined  Responsive to communication filed on 15 May 2006  This action is made final.

A shortened statutory period for response to this action is set to expire Three (3) month(s), 0 days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1.  Notice of References Cited by Examiner, PTO-892.  
2.  Notice re Patent Drawing, PTO-948.  
3.  Notice of Art Cited by Applicant, PTO-1449.  
4.  Notice of Informal Patent Application, Form PTO-152  
5.  Information on How to Effect Drawing Changes, PTO-1474.  
6.

Part II SUMMARY OF ACTION

1.  Claims 1 - 20, 22, 23, 25, 27, 28, 30, 32, 33 are pending in the application.

Of the above, claims \_\_\_\_\_ are withdrawn from consideration.

2.  Claims \_\_\_\_\_ have been cancelled.

3.  Claims 4-6, 11, 15, 16, 18-20, 23, 28 are allowed.

4.  Claims 1-3, 7, 22, 25; 8-10, 27, 30, 12-14, 17, 32 are rejected.

5.  Claims 33 <sup>15</sup> objected to.

6.  Claims \_\_\_\_\_ are subject to restriction or election requirement.

7.  This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8.  Formal drawings are required in response to this Office action.

9.  The corrected or substitute drawings have been received on \_\_\_\_\_. Under 37 C.F.R. 1.84 these drawings are  acceptable;  not acceptable (see explanation or Notice re Patent Drawing, PTO-948).

10.  The proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_, has (have) been  approved by the examiner;  disapproved by the examiner (see explanation).

11.  The proposed drawing correction, filed \_\_\_\_\_, has been  approved;  disapproved (see explanation).

12.  Acknowledgement is made of the claim for priority under U.S.C. 119. The certified copy has  been received  not been received  been filed in parent application, serial no. \_\_\_\_\_, filed on \_\_\_\_\_.

13.  Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14.  Other \_\_\_\_\_

EXAMINER'S ACTION

SN 9108  
U.S.GPO:1990-259-282

Claim 32 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 32, note that it remains unclear what kind of “change” in the “electromechanical devices” is contemplated by the scope of coverage encompassed by this claim. Clarification is needed.

The following claims have been found objectionable for reasons set forth below:

In claim 1, penultimate line, note that --providing-- should be inserted prior to “phase” for clarity of description.

In claim 3, line 3, note that the phrase --said at least one electrically conducting surface including-- should be inserted prior to “a” for an appropriate characterization.

In claim 4, line 2, note that “one” should be rephrased as --first and second-- and “surface” should be rewritten as --surfaces-- for appropriate characterizations; line 3, note that each occurrence of “a” should be rewritten as --the-- in light of the suggested amendment to the claim.

In claim 8, penultimate line, note that “the waveguide path for phase ...” should be rephrased as --a waveguide which defines the waveguide path for providing phase ...-- for an appropriate characterization.

In claim 9, last line, note that “a” should be rewritten as --the-- in view of the suggested

amendment to claim 8.

In claim 10, last two lines, note that “connected to the waveguide for phase” should be rephrased as –connected to the conducting surface of the waveguide for providing phase . . . . for an appropriate characterization

In claim 12, last line, note that --either-- should precede “ a piezoelectric” for a proper characterization; line 8, note that --providing-- should be inserted prior to “phase shift” for an appropriate characterization.

In claim 15, 18, line 6 of each claim, note that --either-- should precede “a piezoelectric element” for an appropriate characterization.

In claim 20, should the use of the term --respective-- be inserted prior to “set” to provide the proper characterization?

In claim 32, should “involves” be rephrased as --is changed by-- for an appropriate characterization?

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 3, 22, 25; 8, 9; 10, 27, 30; 12, 13, 14, 17, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morooka in view of Rao (both of record).

The Morooka reference discloses an in-line waveguide phase shifter comprising: a waveguide (13) having a waveguide path; an iris or wall (14) disposed within the waveguide path and configured to be electrically connected to a conductive surface of the waveguide; a micro-electromechanical (i.e. electrostriction) element fixed to iris (14) and responsive to an actuation signal applied to electrodes (17, 18), which causes the electrostriction element to move, thereby changing the physical dimensions of the iris or wall protruding into the waveguide path; whereby the change in the iris dimension functions as a movable shutter which effects a phase shift in electromagnetic waves propagating through the waveguide. Note from Fig. 3 that a plurality of irises can be configured along the waveguide path to provide improved phase shift. The Morooka reference differs from the claimed invention in that the micro-electromechanical element is not a piezoelectric element.

The Rao et al reference discloses a waveguide phase shifter comprising: a phase shift element disposed with respect to the propagation path along the waveguide to function as a “shutter”, where the phase shift element is movably controlled by a bimorph element (e.g. of piezoelectric material), which is responsive to an applied voltage.

Accordingly, in view of the exemplary teaching in Rao et al, it would have been obvious to have modified the movable electrostriction element in the waveguide phase shifter of Morooka to have been a bimorph element such as taught by Rao et al. Such a modification would have been considered an obvious substitution of art recognized equivalent structures from the same field of endeavor (i.e. waveguide phase shifters), especially since the voltage responsive

nature of the electrostriction element and the bimorph element would have suggested the equivalents there between, thereby suggesting the obviousness of such a modification. Although Morooka discloses a single micro-mechanically adjustable iris, it would have been obvious that a plurality of such irises spaced along the waveguide path would have been likewise made adjustable. Such a modification would have been considered obvious in view of the recognition in Fig. 3 of Morooka, that a plurality of irises can be arranged in a phase shift waveguide, and in view of the recognition that by making each of these irises adjustable as taught by Morooka would have been considered an obvious optimization of the phase shift function.

Claim 7 is rejected under 35 USC 103(a) as being unpatentable over the preceding rejection as applied to claim 1 above and further in view of Malone et al (of record).

Note that the preceding combination differs from the claimed invention in that the phase shifter thereof has not been disclosed as being used in a radar transceiver.

As previously disclosed, Malone et al provides an exemplary teaching of a waveguide phase shifter being used in a radar transceiver.

Accordingly, in view of the exemplary teaching in Malone et al, it would have been obvious that alternative yet equivalent waveguide phase shifters (e.g. such as in the above combination) would have been usable therewith without altering the function of such a phase shifter within the radar transceiver, thereby suggesting the obviousness of such a modification.

Applicant's arguments filed 15 May 2006 have been fully considered but they are not persuasive.

It has been argued by applicants' that the Morooka reference fail or teach or suggest a "shutter being electrically connected to the electrically conducting surface for phase shift and

impedance matching”. More specifically, applicants’ have argued that Morooka uses dielectric material inserts to introduce phase shift only. Furthermore, applicants’ assert that the Rao et al and Malone et al references fail to make up for this deficiency. Finally, similar lines of argument have been provided for the other set of claims, which have been similarly rejected by the Morooka in view of Rao (and further in view of Malone).

Applicants’ arguments have been considered, but have been found to be unpersuasive. First, it should be noted that applicants’ assertion that Morooka uses “dielectric material” inserts is not a proper characterization of what is taught in Morooka. It should be noted that Morooka does not explicitly disclose the material of the inserts. Accordingly, it can not be said with certainty that the insert are of “dielectric” material, such as asserted by applicants’. Moreover, it should be noted, irrespective of the insert material, these inserts when placed within the waveguide do inherently function as shutters and do definitively provide for phase shift. Furthermore, while not explicitly disclosed as providing impedance matching, it should be noted that a certain degree of impedance matching must necessarily be factored into the positioning of the inserts. In other words, for the signal to propagate through the waveguide, then some degree of impedance matching is present, otherwise if there no impedance matching present, the degree of impedance mismatch would certainly prevent the propagation of such a signal down the waveguide and thus make the waveguide phase shifter inoperative. Also, it should be note that irrespective of whether the insert is a dielectric, conductor, semiconductor, etc, by virtue of the insert being located within the waveguide through a opening in the conductive wall of the waveguide, there will always be some form of electrical interaction between the insert and the waveguide wall. For example, even if the insert were a dielectric, it presence within the

waveguide would necessarily perturb the electromagnetic fields within the waveguide and thus affect the corresponding surface currents flowing along the conductive wall of the waveguide, thereby providing that the insert is “electrically connected” in some manner to the conductive wall of the waveguide. Therefore, contrary to applicants’ assertion, the Morooka reference does indeed disclose this aspect of the claimed invention.

Claim 33 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

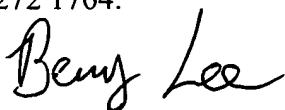
Claims 4-6; 11; 15, 16; 18-20; 23; 28 are allowable over the prior art of record.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Benny Lee at telephone number 571 272 1764.

B. Lee

  
BENNY T. LEE  
PRIMARY EXAMINER  
ART UNIT 2817